



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Ocean Service  
Office of Response and Restoration  
Coastal Protection and Restoration Division  
c/o EPA Region X (ECL-117)  
1200 Sixth Avenue  
Seattle, Washington 98101

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Eric Blischke  
U.S. Environmental Protection Agency  
Oregon Operations Office  
805 SW Broadway Avenue  
Portland, OR 97204

Chip Humphrey  
U.S. Environmental Protection Agency  
Oregon Operations Office  
805 SW Broadway Avenue  
Portland, OR 97204

Dear Chip and Eric:

This letter provides **NOAA's comments on EPA's proposed TRVs for copper and chromium** distributed to the government team on July 24, 2008. The NOAA team involved in developing this response to EPA includes Nancy Beckvar and Rob Neely of the NOAA Office of Response and Restoration, James Meador of the NOAA Northwest Fisheries Science Center, and Bob Dexter of Ridolfi, Inc. NOAA appreciates EPA's efforts in developing TRVs for fish and invertebrate tissue at the site. We recognize that this is a challenging and complex endeavor. Comments provided herein are of a general nature and more specifically focused on proposed TRVs for cadmium.

Comments on copper TRV

General Comment:

Echoing Jennifer Peers comments, only two of the papers discussing the low-concentration responses that were included in the final TRV were discussed in the text accompanying the spreadsheet. It would be helpful to include discussions of additional papers.

Specific Comments:

NOAA considers the mortality response to be a severe effect and maintains that it should not be considered at face value for the protection of aquatic species. For copper, our calculations show that 89% of all the effect values selected and 74% of all final LOER values listed in Table 1 for the copper TRV are mortality responses. NOAA reiterates that TRVs should be developed without using mortality data if possible, and, if insufficient data are available, that a lethal-to-sublethal safety factor be applied to TRVs based on mortality data (as stated in our



previously-submitted comments on the TRV methodology). Similarly, we requested the general use of a correction factor to adjust data collected in short-term, acute studies to be comparable to long-term chronic exposures. In the absence of more applicable data, the average ACR presented in Raimondo et al. (2007) is acceptable.

In the case of copper it appears that there are sufficient studies to calculate separate tissue LOER values for lethal and sublethal endpoints.

There is ample support in the literature for our contention that survival is generally not considered to be an appropriate sole chronic endpoint. The papers by McCarty and Makay (1993) and Chapman et al. (1998) discuss the comparability of lethal and sublethal responses and the suitability of a conversion factor value of 10. Please note in the Chapman et al. (1998) paper that the factor value of 10 is probably the lowest used by agencies as an uncertainty factor.

#### Comments on Specific Studies:

Zyadah and Abdel-Bakey (2000). The authors reported a 24 hour LD67, which is a legitimate value to consider. The LD100 is also a legitimate value. There is no reason why either value (both = 5.9 ug/g) cannot be divided by the safety factor and used for this TRV. This paper should not be eliminated.

Meyer et al. (2002). The estimation of a steady-state tissue concentration is not appropriate for the tissue residue toxicity metric. The authors of this TRV paper are not certain if the critical body residue for copper (e.g., the LA50) is or is not time-independent. This LA50 of 2.4 ug/g is a legitimate value and the adjustment for bioaccumulation is not supported.

King et al. (2004). Why not use the stated value of 8 ug/g (LD78)? Trying to figure out the tissue concentration for this aqueous exposure and toxic response seems contrived. Please provide a justification for the rejection of this value?

Papers by Roesijadi et al. (1980), Milanovich et al. (1976), and Absil et al. (1996) need the lethality correction factor.

#### Citations

Chapman PM, Fairbrother A, and Brown D. 1998. A critical evaluation of safety (uncertainty) factors for ecological risk assessment. *Environ Toxicol Chem* 17:99–108.

McCarty LS and Mackay D. 1993. Enhancing ecotoxicological modeling and assessment. *Environ Sci Technol* 27:1719–28.

#### Comments on chromium TRV

Please include for review the paper by Buhler, D.R., R.M Stokes, and R.S. Caldwell. 1977. Tissue accumulation and enzymatic effects of hexavalent chromium in rainbow trout (*Salmo gairdneri*). J. Fish. Res. Board Can 34:9-18. Buhler et al. pulled their value from P.O. and R.M. Stokes. 1962 Assimilation and metabolism of chromium by trout. J. Water Pollut. Control Fed. 34:1151-1155. This study showed an effect concentration of 2.8 ppm for 50% mortality in yearling rainbow trout after 36 day exposure to chromate.

NOAA appreciates the opportunity to provide these comments. Please let us know if you have any questions or require further clarification on any of the information we have provided via this comment letter.

Sincerely,

Robert Neely  
NOAA Regional Resources Coordinator

cc: Mary Baker, NOAA / NOS / ARD (by email)  
Nancy Munn, NOAA / NMFS / HCD (by email)  
Katherine Pease, NOAA / GCNR (by email)  
Chip Humphrey, USEPA (by email)  
Eric Blischke, USEPA (by email)  
Joe Goulet, USEPA (by email)  
Burt Shephard, USEPA (by email)  
Jennifer Peers, Stratus Consulting (by email)  
Jennifer Peterson, Oregon DEQ (by email)  
Jeremy Buck, USFWS (by email)  
James Meador, NOAA / NWFSC (by email)  
Bob Dexter, Ridolfi Inc. (by email)  
Rose Longoria, Yakama Nation (by email)  
Rob Neely, NOAA / NOS / ARD (by email)